

Notice of Allowability

Application No.

10/634,490

Examiner

Joseph P. Hirl

Applicant(s)

LAWRENCE ET AL.

Art Unit

2129

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to May 18, 2007.
2. ☒ The allowed claim(s) is/are 1-44, 48-53.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material

5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


JOSEPH P. HIRL
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100

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Reasons for Allowance

1. Claims 1-44 and 48-53 are allowed since reading such claims in light of the specification, as per MPEP § 2111.01, In re Sneed, 710 F.2d 1544, 1548, 218 USPQ 385 (Fed. Cir. 1983), none of the references of record alone or in combination disclose or suggest the combination of limitations specified in the independent claims.

Definitions:

Correlithm Object (corob): (Lawrence, USPN: 6,167,391, c6:52-59; c14:18-30)

The primary token of data representation and manipulation in corob systems. The term Corob is a contraction of the words CORrelithm Object, because a corob is a correlithm object. A point in generalized sub-space of a particular space. Also, an architectural construct, a corob data area, of the present invention suitable for containing the data of a corob, where usage is clear from the context.

Suppose that in space S, a large number of corobs are defined. Let the sub-space and points represented by these corobs be chosen at random. Select any one of these corobs, for example, corob C1. Let the preferred Cartesian distance metric be applied from C1 to each of the other corobs and a mean and standard deviation of the resulting distances be computed. It can be shown both by direct computation and by mathematical analysis that the ratio of this mean to the standard deviation grows monotonically as the number of dimensions of S is increased. This ratio expresses the mean or expected distance between two randomly chosen corobs in terms of some number of standard deviations.

Quantum Objects: (Specification, p7:31-32; p8:1)

... quantum objects such as quantum bits ("qubits"), quantum registers of $q > 0$ qubits, and ebits that include quantum registers of $q > 1$ qubits.

Physical Objects: (Specification, p20:5-15)

Furthermore, example embodiments may be applied to other suitable physical objects of a physical system. A physical object refers to an object that may be described by a state space. Examples of physical objects may include DNA molecules or chemical compounds. Examples of physical systems may include quantum, photonic, electronic, magnetic, chemical, molecular, nanotechnical, biological, DNA-related, neurological systems without departing from the scope of this invention. A physically-encoded correlithm object may be formed from arrays of physical objects.

2. The claims of the invention generally limits to a result that represents a computational system (Specification, p1:16) which is a practical application.

Independent claims 1, 8, 15, 22, 29, 30, 31, 35, 39, 43, 44, 48 and 51 all limit to

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correlithm objects (corobs). The prior art of Nielsen limits to "Quantum Computation and Quantum Information" but does not address the subject of corobs. The prior art of Lawrence in USPN 6,167,391 does not address the concepts of Quantum Objects, Physical Objects or Tensor operations.

3. Applicant's response to the objections to claims 49, 50, 52 and 53 are acknowledged and the objections are withdrawn.
4. The rejection of claims 1-44 and 48-53 under 35 USC §101 related to a result that is a practical application is withdrawn since the invention generally limits to a result that represents a computational system (Specification, p1:16) which is a practical application.
5. The rejection of claims 22, 39 and 51 under 35 USC §101 related to computer program listing per se are withdrawn considering functional descriptive material that is embodied in a computer-readable storage medium that is further capable of permitting the computer program's functionality to be realized.
6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Correspondence Information

7. Any inquiry concerning this information or related to the subject disclosure

should be directed to the Primary Examiner, Joseph P. Hirl, whose telephone number is (571) 272-3685. The Examiner can be reached on Monday – Thursday from 5:30 a.m. to 4:00 p.m.

As detailed in MPEP 502.03, communications via Internet e-mail are at the discretion of the applicant. Without a written authorization by applicant recorded in the applicant's file, the USPTO will not respond via e-mail to any Internet correspondence which contains information subject to the confidentiality requirement as set forth in 35 U.S.C. 122. A paper copy of such correspondence will be placed in the appropriate patent application. The following is an example authorization which may be used by the applicant:

Notwithstanding the lack of security with Internet Communications, I hereby authorize the USPTO to communicate with me concerning any subject matter related to the instant application by e-mail. I understand that a copy of such communications related to formal submissions will be made of record in the applications file.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, David R. Vincent can be reached at (571) 272-3080.

Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,
Washington, D. C. 20231;

Hand delivered to:

Receptionist,
Customer Service Window,
Randolph Building,
401 Dulany Street,

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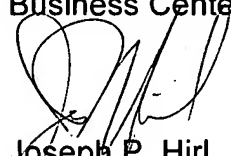
Alexandria, Virginia 22313,

(located on the first floor of the south side of the Randolph Building);

or faxed to:

(571) 273-8300 (for formal communications intended for entry.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).



Joseph P. Hirl
Primary Examiner
July 26, 2007